

# CNZ1102, CNZ1108

## Photo Interrupters

For contactless SW, object detection

### Overview

CNZ1102 and CNZ1108 are a photocoupler in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity phototransistor is used as the light detecting element. The two elements are arranged so as to face each other, and objects passing between them are detected.

### Features

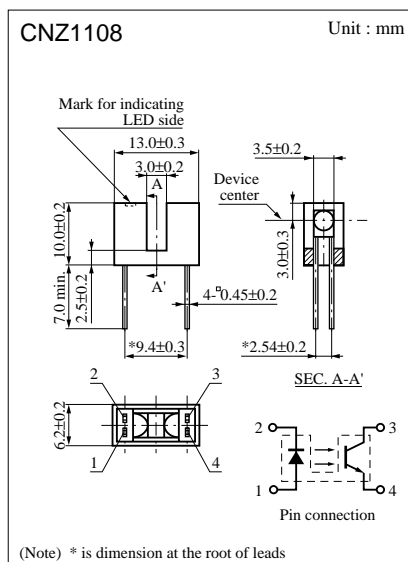
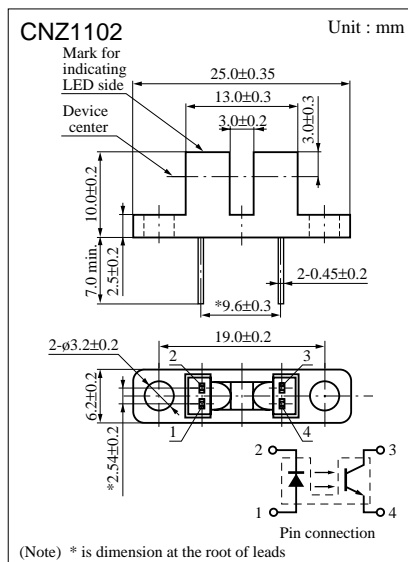
- Position detection accuracy : 1.2 mm
- Large output current
- Fast response :  $t_r, t_f = 4 \mu s$  (typ.) (CNZ1102)  
6  $\mu s$  (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

### Absolute Maximum Ratings ( $T_a = 25^\circ C$ )

	Parameter	Symbol	Ratings	Unit
Input (Light emitting diode)	Reverse voltage (DC)	$V_R$	3	V
	Forward current (DC)	$I_F$	50	mA
	Power dissipation	$P_D^{*1}$	75	mW
Output (Photo transistor)	Collector current	$I_C$	20	mA
	Collector to emitter voltage	$V_{CEO}$	30	V
	Emitter to collector voltage	$V_{ECO}$	5	V
	Collector power dissipation	$P_C^{*2}$	100	mW
Temperature	Operating ambient temperature	$T_{opr}$	-25 to +85	$^\circ C$
	Storage temperature	$T_{stg}$	-30 to +100	$^\circ C$

\*1 Input power derating ratio is 1.0 mW/ $^\circ C$  at  $T_a \geq 25^\circ C$ .

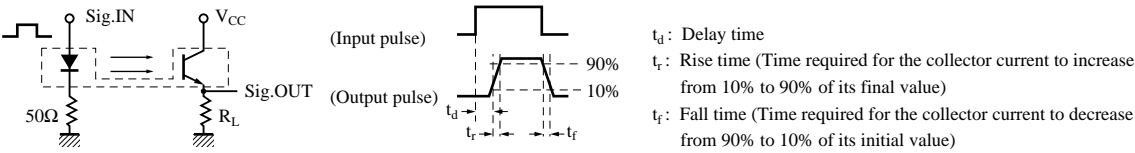
\*2 Output power derating ratio is 1.33 mW/ $^\circ C$  at  $T_a \geq 25^\circ C$ .



■ Electrical Characteristics (Ta = 25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = 50\text{mA}$		1.2	1.5	V
	Reverse current (DC)	$I_R$	$V_R = 3\text{V}$			10	$\mu\text{A}$
	Capacitance between terminals	$C_t$	$V_R = 0\text{V}$ , $f = 1\text{MHz}$		50		pF
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 10\text{V}$			200	nA
	Collector to emitter capacitance	$C_C$	$V_{CE} = 10\text{V}$ , $f = 1\text{MHz}$		5		pF
Transfer characteristics	Collector current	$I_C^{*2}$	$V_{CE} = 10\text{V}$ , $I_F = 20\text{mA}$	2			mA
	Response time	CNZ1102	$V_{CC} = 10\text{V}$ , $I_C = 5\text{mA}$ , $R_L = 100\Omega$		4		$\mu\text{s}$
		CNZ1108	$V_{CC} = 10\text{V}$ , $I_C = 1\text{mA}$ , $R_L = 100\Omega$		6		$\mu\text{s}$
	Collector to emitter	CNZ1102	$V_{CE(sat)}$ , $I_F = 50\text{mA}$ , $I_C = 1\text{mA}$			0.4	V
	Saturation voltage	CNZ1108	$V_{CE(sat)}$ , $I_F = 50\text{mA}$ , $I_C = 0.1\text{mA}$			0.4	V

\*1 Switching time measurement circuit



\*2  $I_C$  classifications

Class	Q	R	S
$I_C$ (mA)	2.0 to 5.0	4.0 to 10.0	7.0 to 20.0

